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ABSTRACT

The role of questioning techniques in the classroom is discussed, with particular emphasis on the cyclical nature of teacher-student dialogues. Excerpts from transcripts of actual dialogues are also analyzed. According to the model, based on Piaget's theory of cognitive development, the questioning strategies are designed to enhance the student's cognitive development. The model also suggests that development is a response to a discrepancy between exogenous experiences and endogenous wishes, desires, interests, or states. By generating discrepancies in children, parents or teachers contribute to their cognitive growth. Discrepancies, either cognitive or affective, are generated by distancing behaviors, which require the child to attend to or react in terms of the future, the past, or abstract language. The characteristics of inquiries which instigate such thinking in children are described. The affective states which may result from various questioning techniques are also addressed. Examples of distancing are presented from taped transcripts involving teaching the numbers one to ten and measures to kindergarten children, as well as three classroom discussions with older students. These examples illustrate that the teacher's distancing strategy determines the direction of the discussion, and hence, the learning cycle. (GDC)

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A Cognitive Developmental Approach to Question Asking: A Learning Cycle-Distancing Model

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A Cognitive Developmental Approach to Question Asking: A Learning Cycle-Distancing Model[1]

The aim of this paper is to discuss the role of questioning in a classroom context, with particular emphasis on the cyclical nature of the teacher-student dialogues. Embedded in this cyclical movement are questioning strategies which serve to propel the individual along a cognitive developmental trajectory, leading to new knowledge and understanding. We shall present the theoretical basis for this model after first discussing our general conceptualization.

The theoretical framework guiding our perspective stems from the work of Piaget (Piaget, 1950). Piaget's theory is a structural developmental one which holds that cognitive growth proceeds in an invariant stage-like sequence, wherein each stage defines two major functions: one, how the child's knowledge is organized and two, the mental operations he/she has available with which to deal with knowledge acquisition and utilization. In general the course of cognitive development, according to Piaget, is from a sensori-motor level where knowledge is acquired and used in terms of the here and now, where reality is what appears, and the emphasis is on action with objects as bases of learning. From the sensori-motor stage the child moves through other stages in sequence enroute to one in which he/she becomes increasingly capable of making inferences, developing the capability to engage in mental activity involving hypothetical reasoning, and anticipating outcomes using past experiences. All of this is a basis

for further planning and problem solving. We refer to these latter cognitive functions as indicators of representational thinking. We shall have more to say about this class of intellectual competencies later.

Impressive as Piaget's description of the stages of cognitive development are and the careful detailing of the contents of each stage, he also details how children move from one stage to another. Piaget and others (Sigel & Cocking, 1979) have suggested that the child makes stage transitions as a function of cognitive conflict embedded in a social context. It is argued that there has to be some perturbation in that social milieu that upsets the basic cognitive equilibrium. Once this occurs, the individual has to restructure his orientation in order to adapt to this new set of demands. Piaget's theory essentially speaks of cognitive growth as adaptive to the demands of the environment. In essence his theory is an interactive one, where interactions occur between the individual and the social milieu in which the person is embedded. As we shall demonstrate, the cyclical nature of inquiry dialogues follows prototypically the phases of the learning cycle: focus, exploration, and restructuring (Kelley, 1985).

Given the significance of social experience and the constraints of the environment, the question arises as to how and what in that environment contribute to the child's cognitive development. Just to assert that conflict propels the individual toward maturity implies that all that is needed is the presence of conflict which will provide the momentum. What is needed, we argue, is identification of the

particulars which generate the perturberations. Our argument is that the content of questioning strategies, their target and the timing of their use, coalesce to influence the course of cognitive change.

It is within this framework that we wish to spell out the details of our conceptualization of the role of questioning in the larger context of the Learning Cycle, and so provide an enlarged perspective of the teaching-learning process. By translating this theoretical perspective into a structural model, we believe we will have constructed an approach that can be applied to the classroom by teachers at any level of education. It can be used to generate a protocol of the dialoguing in the classroom and consequently enable teachers to analyze their own performance in the classroom by giving them a chance, not only to listen to themselves, but also to listen to the children.

Our Conceptual Framework

In this paper we shall zero-in on the role of a particular class of events which activates, maintains, and furthers cognitive growth and in which question asking plays an important role. But first let us provide some of the fundamental propositions upon which our case will rest. Following such a discussion we shall construct a model and demonstrate its practical utility as we analyze the Dillon tapes.

One proposition that has guided the work on cognitive development is that development proceeds as an adaptation to the perturbation created by the mismatch between exogenous experiences and endogenous wishes, desires, interests or states. The mismatch might be referred to

as discrepancy (Sigel & Cocking, 1979). We use the discrepancy construct because it is not overloaded with meaning from other theoretical perspectives, e.g., psychoanalysis or political science notions. Discrepancy is neutral in connctation and provides the appropriate heuristic for developing a dynamic model of cognitive growth.

Functionally, discrepancies are postulated as producing discrepant states which activate the individual to do something to recreate an equilibrated state (disequilibrium). The actions are required to recreate equilibrium take many forms, such as reorganizing one's perspective which involves assimilating new knowledge, or rejecting the validity of the new experience and hence expunging it as legitimate. Other mechanisms for dealing with disequilibrium will be discussed later.

The discrepancy-resolution thesis requires further explication to make it amenable to empirical testing. We proceed by identifying types of discrepancy and defining events which generate discrepancies. Then we shall proceed to demonstrate various ways of coping with discrepancies.

Types of discrepancy. It will be recalled that the generic notion of discrepancy is that it is a mismatch of two or more events. "Three types of discrepancies can be identified: (1) a mismatch between an internal state and an external event" (Sigel, & Cocking, 1979, p. 216), e.g., the individual wants to buy a new car and he/she does not have the funding; "(2) a mismatch between two internal events--an expectancy and

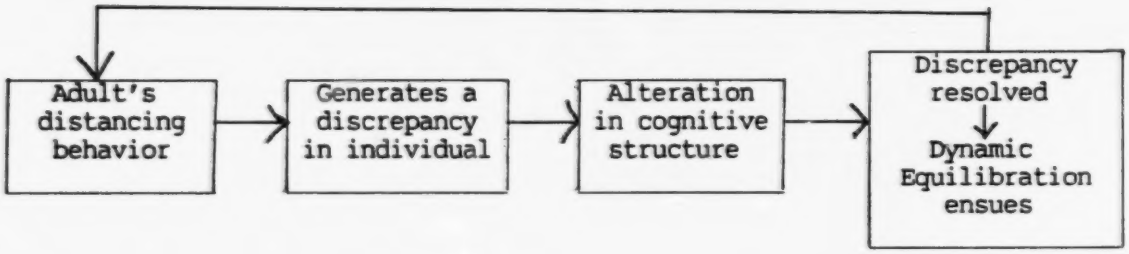
an action are in conflict; and (3) a mismatch between two external events" (Sigel, & Cocking, 1979, p. 216), e.g., when an individual is given two sets of orders to be executed at the same time.

A discrepancy can be an exogenous-endogenous mismatch which the individual experiences as a violation of expectancies. Resolution of the discrepancy occurs when the individual alters his/her approach.

The discrepancy construct is defined in terms of its formal properties. Discrepancies can also be identified in different content areas, which may require different modes of resolution. For now let us identify two specific areas--cognitive and affective. Cognitive discrepancies may involve logical mismatches, e.g., a child may be presented with a problem requiring logical inference, but he/she does not interpret the question as intended by the questioner; discrepancies may be in the affective domain, e.g., loving someone who does not reciprocate. No doubt one can enumerate a wide variety of content discrepancies.

Sources of discrepancies. Discrepancies are intrinsic to living and they occur in planned or unplanned ways during the course of one's existence. The type of discrepancies that are of interest in this presentation are those planned by social agents, especially parents and teachers with their children. The reason for focusing on this aspect of the problem is because through generating discrepancies in children, adults contribute to children's cognitive growth. Discrepancies are generated by distancing behaviors.

Distancing strategies refer to those classes of behavior which create any of the type discrepancies described above. Hence distancing strategies serve a mediating function which can be diagrammed as follows:



The Distancing Hypothesis

Distancing behaviors can be characterized as to their form, function, and determinants. Each of these characteristics contributes to the development of representational competence, the capability to represent social, physical, and personal realities, and the concurrent development of an understanding of the media of representation (pictures, verbalizations, and gestures). Distancing behaviors are actually stimulus situations for the child in that they:

> create temporal and/or spatial and/or psychological distance between self and object. "Distancing" is proposed as the concept to denote behaviors or events that separate the child cognitively from the immediate behavioral environment. The behaviors or events in question are those that require the child to attend to or react in terms of the nonpresent (future or past) or the nonpalpable (abstract language). (Sigel, 1970, pp. 111-112)

Although distancing stimuli (behaviors of others and events) can emanate from social and physical events, the focus in this chapter will be on verbal or gestural distancing behaviors, in effect, communication from others to the child. The verbal/gestural distancing behaviors comprise one subset of the general class "distancing stimuli," and manipulation of the physical and/or social environment comprises another subset. The purpose of this presentation is to emphasize the direct, social communicative network as the social context. The hypothesis is as follows: There is a class of events which effect representational thinking comprised of distancing behaviors.

Forms of Distancing Behaviors

The distancing behaviors in this presentation are verbal and as verbal events contain characteristic features of verbal communication, for example, content (meaning) and a syntactical structure.

Each distancing behavior is defined in terms of the "mental demands" presented to the receiver of the message (see Table 1). For example, a distancing behavior is labeled inferring cause-effect because the message for the receiver is to engage in inferential thinking to determine causal relationships. Perusal of the table will show the range of messages which demand representational and inferential thinking.

Insert Table 1 about here

The form of the communicative strategy can be either declarative or interrogatory. In the declarative statement, the sender "tells" the receiver something, for example, "This is a pen (pointing to a pen)," or "The reason the rabbit went away is because the dog frightened him," a cause-effect statement.

Distancing strategies can also be interrogatories. A further distinction is made between questions which are for verification of messages already presented and questions which stimulate problem solving. The first type is the condition which could occur after a declarative statement has been made; for example, (a cause-effect statement), after reading a child a story the adult might say, "The reason the rabbit in the story ran away was that he was frightened." The child could then be asked, "Now why did the rabbit run away?" and the child could answer by reproducing part of the initial statement (e.g., "Because he was frightened").

On the other hand, question asking could take the form of an open-ended approach. Using the previous example, the adult might ask, "Why do you suppose the rabbit ran away? The child reconstructs the encounter.

Another feature of a distancing strategy is the "temporal" aspect. The time frame may be the contemporaneous present, the past, or the future. The time constraints reflect the anticipatory schema (future), reconstructive schema (past), or contemporaneous constructions. The various time constraints make different demands on the child. Anticipation requires organization of experience in the context of

prediction or expectation, in contrast to the past, which requires an organization of previous experience with no projections into the future.

The temporal aspect of distancing is a crucial dimension since it is the coping with time that instigates representational thought. To reproduce or to reconstruct the past or to plan for the future requires mental representations.

Functions of Distancing Behaviors

Although distancing behaviors share the basic characteristic of a cognitive separation between the individual and the immediate present, they are presumed to vary in the degree and the way they activate this separation. The demand characteristics are contained in the message and the form. The function of the message is defined by the behavior as listed in Table 2, but the significance of the linguistic form is not to be overlooked, since structures of statements serve to affect mentations.

Insert Table 2 about here

Declarative statements, which demand convergent responses, require passive listening, in contrast to inquiry, which demands active engagement; for example, "The dog's name is Gimcrack" versus "What is the dog's name?" or "Can you tell me anything about the dog?" A declarative distancing strategy does not require the child to employ the same mental operations as an inquiry. In the former, the child receives the message, may retain it, processes it, and may or may not have to

demonstrate understanding of the message. The inquiry strategy makes specific requirements for the child to engage mentally to answer the question.

The demand characteristics of open-ended inquiry, in particular, function as instigators, activators, and organizers of mental operations. The only way the child can answer a question is to become actively engaged, producing those mental activities demanded by the inquiry.

Table 2 is a summary of the forms verbal distancing often takes when adults attempt to instigate thinking in children. The form, whether declarative, imperative, or one of the interrogatives, is effective to a greater or a lesser degree according to the open endedness, so that requests for convergent responses ("Tell me the name of the dog") are less demanding in their reliance on representational thinking than are more open-ended discussion initiators ("Tell me more about the story.")

Functions of Questions

We have described the types of distancing strategies. In this section we shall like to develop further the analysis of questions. However, the structure of questions is conceptualized in terms of two additional categories: (1) the types of verbal response questions will elicit determined by their linguistic structure and (2) the psychological effects which questioning may elicit, especially affective states.

Beginning with the relationships between structure of the question and response, the linguistic structure generates "demands" that reduce the degrees of freedom of the respondent, not only in terms of content, but also in terms of cognitive demand. For example, asking a why question is intended to elicit an explanation, but also a justification. In effect a why question asks for two levels of explanation--one in context and one in the psychic level, whereas a how question asks for a description of an event, but does not imply justification. Each question form: what, where, why, when, and who, engages a different mental process as well as different types of content. When is time oriented, where is location, and so on. Each interrogative arouses particular schema, e.g., time, place, person, etc. These interrogatives in themselves have cognitive implications and the responses are contingent on the developmental level of the respondent.

Respondent characteristics that must be considered include developmental level, intellectual level, verbal sophistication, context, and informational demands. For example, the same simple time question, "When did your mother bring you here?" will yield a different level of response from a five-, compared to a fifteen-year-old, the concept of time is differentially understood by the young child compared to the adolescent or the adult. This is not a vocabulary problem, but a conceptual one.

Using a Piagetian-type conceptualization, the cognitive level of a child is described by stage-like characteristics. For the child whose understanding of influences and causal connections, for example, is

limited, questions requiring inferential reasoning will not be understood nor responded to as would the same question posed to an adolescent thinker who can think and reason in logical deductive ways. Another example is where the young child may be asked how a number of discrete objects are alike. The young child can usually use only one criteria, e.g., color, form, or function, whereas an older child is usually able to coordinate two or more attributes to build his/her class, e.g., color and form, or different functions. The ability to generate hierarchical classifications is a function of the child's cognitive developmental level.

Parenthetically, age is not the most reliable criterion to define cognitive stage. Rather, the quality of the individual's response should be used as the criterion. There is enough evidence to support the notion that the ability and the interest in logical thinking competence are not as frequent among adolescents and adults as one might think. Since this is the case, it becomes even more important that teachers, especially, shift criteria from age to students' functional cognitive level thereby structuring and phrasing their questions more appropriately.

In sum, then, each interrogative in and of itself generates a cognitive demand on a particular schema. The response of the child therefore has to be evaluated in terms of the child's developmental level. The child can only understand the question to the degree it is consistent with available cognitive schema, disturbed by the type of interrogative.

Comprehension of the interrogative interacts with the remaining content of the question. The child may not understand the meaning of why, but know something about elements of the message, or the child may know the meaning of why, but not have the knowledge necessary to answer the question. The test for the inquirer is to be able to use the child's response as a clue to his/her understanding.

Every interrogative arouses affect from mild to intense. The tendency, however, in much of the discussion of questioning is to minimize or ignore the affective aspects, especially when they are not obvious. It is obvious that a student can be disturbed by the way a question is asked. But, we contend affect is intrinsic in any inquiry interaction however intense or mild and how apparent or not. Students may well mask feelings when asked questions. Difficult as it may be to identify such affective states, the inquirer must be sensitive and try to tune into the respondent's affective state. Chances are questions might be interpreted as hostile, disparaging, seductive or warm, friendly, supportive. Among the oft overlooked features of the inquiry process that foster the particular class of feelings are the intonation, the lexical structure of the question, the nonverbal cues (body language), and the timing of the question relative to other task assessment procedures.

Questions that probe, that go beyond the superficial information seeking, generate tension. Tension can vary in intensity and comfort level as a function of how the questions are asked. One inquirer may generate distress because of tone and frequency intent to criticize or

to destroy. The benign interrogator would present the question with an honorable intent and with hope to clarify. Between these polarities exists a broad range of inquiry styles which activate various emotional states.

Of course in most contexts, the issue of trust of the intentions of the questioner comes into play. In the extreme case, for example, in political contexts, the powerful inquisitor may deliberately use a quiet, seductive tone to demonstrate the she/he is trying to help. Often individuals can be misled by such soothing actions.

While various styles of interrogation serve different purposes, e.g., the prosecutor trying to trap a witness, the detective trying to trap a suspect, we would suppose that for education there is an optimal style that while generating discomfort, the intent of the inquirer is not suspect and the tension generated is not destructive but rather, is adequate to activate the child cognitively. This arousal may be broadly considered affective.

Since questions have both a cognitive and affective quality, they are in effect multi-level stimuli. In some cases the term cognitive-affect complex may be in synchrony, i.e., the content of the question and affect arousal are equally moderate and appropriate or there can be asynchrony where either the cognitive or affective features may be emphasized. A question with a seemingly benign cognitive demand but intense negative affective tone may preclude an appropriate answer. Conversely, a question might pose a difficult cognitive demand but the affective arousal tone may be benign. An example of the former might be

where the five-year-old is asked, in a sneering tone, to tell about a trip he/she made "So, where did your parents take you yesterday?" or in a benign tone, "Can you tell me what was wrong with your grandmother when you saw her yesterday?" The tone in this case may be benign but the type of information requested may be too complex for the child. Hence he/she may turn away and not answer. Thus, the inquirer should be sensitive to the cognitive-affective featurs of a question.

The impact of any of these questions is greater when the question is a follow-up one rather than an initial question. In two studies done on cognitive-type inquiry, it was found that the significant psychological effect of inquiry is the effect of the follow-up question (Rosner, 1978). The initial question by itself seems to be of less moment, perhaps because the discrepancy is not as intense. When a question is answered and followed by another question, it might suggest to the student that the initial response was unsatisfactory and therefore the need to provide a more statisfactory answer is required. If the inquiry goes on, then the student may get increasingly dissatisfied and frustrated feeling he/she is always on the spot. Questions may inhibit learning rather than facilitate it because the intent of the inquirer is perceived as critical and non-accepting of the respondent's response. If the teacher answers a question with a question, the student wonders, "What did I say wrong?"

Distancing and Questioning Strategies: Some Considerations

To this point, the model we have presented appears as a rational approach where various types of behaviors have been classified in terms of their verbal structural properties with but passing attention paid to the affective features involved. In a sense, such an analysis decontextualizes the adult-child interaction from the inter- and intrapersonal features in a particular setting. To gain a broader perspective of the situation in which distancing behaviors are expressed, let us complement the previous discussion by placing the entire questioning strategy in a social context from an interactionist point of view.

We shall begin by describing an adult-child interaction, considering it initially as an abstraction before embedding the analysis in a particular social and physical setting.

Role of Adults in the Inquiry Process

Any observer of an adult-child interaction must be immediately struck with the obvious: the adult is larger, older, more experienced than the child and as a consequence has power—power to control material and psychological resources. The powerful adult plays many roles in the child's life in the context of power. Not only does the adult control resources, the adult also judges when and how to dispense these resources. Distribution of material and psychological resources is at the discretion of the adult. The child's choices in this interaction are contingent upon what the adult allows the child to do. These structural and phenotypical actions describe the adult-child

interactions in a "po[illegible]" context, which is indigenous to any adult-child context.

The description is in a sense an ideal, an ideal type in Redfield's sense of a type. However, there is a series of factors which play a significant role in setting constraints and directions of the quality of the adult's use of power. In previous research in which the role of parents relative to a power relationship was examined, it was found that the way parents deal with their power potential depends on their conception of the child, on what are the sufficient and necessary ingredients for development, and what actions of the parent are needed for the appropriate outcomes to evolve.

From current research on parents' beliefs about children, for example, a variety of beliefs are found, ranging from beliefs that children learn through action on materials and exploring these materials, to beliefs that children learn through direct instruction (McGillicuddy-DeLisi, 1982; Sigel, 1985). The former beliefs may well be expressed in strategies that enable the child to be exploratory and to construct his/her own knowledge of the world through his/her own actions. In the latter case the child is the passive recipient of parental guidance. These are examples of how the parents expressed their power.

The term <u>teacher</u> can be substituted for the term <u>parent</u>, since in every interpersonal situation with any adult and child, the adult is nominally the power agent. The limits are due to personal decisions of expression and the manner power is used. By using the general term

adult, parents and teachers share similar roles. So, the results of the research, be they from parent or teacher studies, share similar implications.

The Role of Power and Affect

The "power" issue may appear tangential if one focuses solely on the linguistic rational discourse. However, if one shifts the focus to the psychodynamic aspects of human interaction, then two relevant interactive dimensions immediately come to mind in the "power" context. These are the affective relationship including trust and the developmental level of the students.

Affect is inherent in every interpersonal transaction and inquiry interactions are no exception. Irrespective of the individuals involved, posing a question to an individual "puts him/her on the spot" because there is a cognitive demand to respond. Irrespective of how the question is phrased, it "demands" some response. Questions, to be sure, can vary in degree of "threat" or provoking anxiety. There is a close connection between the power role and affect arousal. Although we discussed the affective feature previously, in this section we would like to elaborate on it since it is an area too often overlooked or underemphasized.

Our contention, as previously stated, is that every question, no matter how psycholinguistically simple, can arouse affect. The particular affective response, of course, can vary. Questions posed by adults to children should be evaluated in the power context. For example, a teacher asking a child where he/she is going, or what his/her

plans are, can be interpreted as intrusive and expression of power. An excellent example of this in the classroom is a teacher asking a child questions aimed at determining what the child knows or how he/she will go about solving a problem. Such questions, in effect, test the child's knowledge and challenge him/her to demonstrate competencies. There is probably an implicit right and wrong answer here. Thus, the child may well become anxious or feel threatened. Such interrogatory situations are one-sided; the adult being the interrogator, coming from a position of power. Evidence for the one-sided power relationship can be found in the discourse. Let us ask, is a child entitled to the same privileges—asking teachers what they know and how they will go about solving a problem? Of course, it will be argued that some teachers encourage two-way questioning as will parents. However, the fact that the adult allows this type of interaction is an indication of power—the adult allows.

The way the argument has been presented suggests that the power factor is a deterrent to developing productive inquiry interactons. This is not necessarily the case. It is the recognition of the power factor that is a necessary first step toward generating a positive, meaningful and fruitful interaction.

Reduction of threat, discomfort and anxiety requires the establishment of a trust authentic inquiry situation. The "how to do it" is different for the teacher and for the parent. Since this paper addresses educational contexts primarily, examples with teachers will be used.

Affect arousal during an inquiry can be positive--the exicitement, the thrill, the enjoyment of partaking in an interesting discussion, or problem solving or problem defining. Or, affect can arouse feelings of threat, self, anxiety, a sense of powerlessness and similar negative states. This may be particularly the case since the child may feel that he/she is being evaluated.

Affect is aroused not only by the inquiry but by the context in which the inquiry process taskes place. Imagine a student being asked a question in a classroom setting and not knowing how to respond; or imagine a student struggling to articulate a problem solution, but not fast enough for either the teacher or follow students.

No doubt the readers can conjure up many situations in which either positive excitement or embarrassment and feelings of inadequcy have been aroused during an inquiry session.

Although little research has been done, to my knowledge, assessing the relationships between positive/negative affect and learning in an inquiry situation, the role of affect as a positive and/or negative factor can be deduced from analysis of the components of the context and our general psychological knowledge regarding relationships between positive (e.g., liking a subject, interest, etc) and negative (e.g., fear, anxiety, feelings of helplessness, etc.) affect.

Since inquiry can generate such a range of feelings, it behooves the teacher to be cognizant of how affect might influence student gains from inquiry.

The above discussion defined the affect-inquiry problem. Let us move on to a discussion of the role of affect in the distancing model which is, of course, the core of this paper.

The Role of Affect in the Distancing Model

The reader will recall that the theory holds that cognitive demands made by the adult to the child encourage the child to separate self from the ongoing concrete present. Distancing behaviors serve to activate or generate schema that involve reconstruction of the past, anticipation of the future, or disengaging from the ongoing present.

Distancing cognitive demands also indirectly require the child to separate "self" from the teacher. The child is in a sense "pushed" away by the logic of questioning and at the same time cognitively separating self. Perhaps an example will help clarify the issue. Imagine the following dialogue:

C: (painting with an easel) Every time I put my brush in the paint can and take it out it drips over the floor.

T: Can you think of any ways to stop the dripping?

C: (thinks to self--I want to paint my picture. Why is she bothering me?) No I can't.

T: What makes it drip?

C: I have too much paint on the brush.

T: What might you do to check that out?

The rest of this dialogue can be filled in by you, the readers. What is happening in this interaction is that the child has a problem which is merely instrumental--a means to the end--painting. The child asks for

help, but the teacher used this situation as a "learning to problem solve" situation. The teacher's goal and the child's goal are in direct conflict. The teacher is diverting the child, frustrating his/her painting activity. One can imagine the child leaving the scene or ignoring the teacher and continuing on his/her own way. In either event, the teacher has activated feelings that can intrude in the primary activity of the child.

This example illustrates how the disregard for the child's affective status by the teacher can undo the educational opportunities in a situation.

It seems reasonable to suggest that the illustration provided above is a generic description of any power structured situation--whether the power is explicit or implicit: teacher-student, supervisor-supervisee, principal-teacher. In a later section we shall suggest ways of preventing negative breaks in the dialogue due to emotional factors.

Distancing strategies not only can generate a sense of frustration when the child is interrupted during a task, but can also create distress when the teacher "bombards" the child with questions. Rapid-fire pacing of cognitive demands may overwhelm the child, in a sense suffocating him/her. Not allowing the child sufficient time to think, to reflect about what is asked of him/her, can also create distress. Further, such pressure may contribute to the child's sense of being rejected since the adult is not sensitive to the child's state.

Overall, distancing strategies can be perceived by the child as an interactive mode that "pushes" him/her away from the adult. After all,

"If the teacher cares about me," thinks the child, "why is he/she not helping me but always asking questions?"

In conclusion, the emphasis on the emotional aspects of inquiry should not be underestimated--it is a double-edged factor. On the one hand it can undo the very process it is intended to achieve; on the other hand, it can create excitement and exhilaration in the process of discovery. It is incumbent on the teacher to become sensitive to these affective components by tuning in to the child's total response, by pacing the inquiry, and by noting when to back off. We find that only by such sensitivity responses on the part of the adult can the effort work.

Some Structural and Meaning Considerations

One issue that needs reiteration and brings the discussion of inquiry and questioning into contact with two areas of support: structural linguistics and hermeneutics. Let us address each of these briefly.

As will be recalled, form of the question is an important feature of the inquiry process. The reason this is the case is because how a question is posed and when it is presented, structures the response of the respondent. This relationship must be explored in depth because it contributes to clarifying the import of inquiry. Questions constrain responses in part due to the directive terms used. Of course, use of introductory terms by teachers presupposes the child truly understands the meaning of the wh terms and so can follow the directions. That is

to say the teacher may introduce a question with why assuming the child is aware that "why" questions require justifications or cause-effect answers. If the child fails to answer the question, is it because he/she does not understand the meaning of why, or that he/she does not know or does not have an answer? Question users must be made keenly aware of the issue of the relationships between the child's knowledge and the structure of the question. The search for connections between the complexities of language and consequent thinking that evolves from linguistic interactions will enhance our understanding of what there is about questioning that contributes to the development of thought--which is, of course, the basic goal of our collective endeavor.

In addition to the relevance of linguistic structural analysis, the role of meaning or interpretation of the question comes into play. The child has a meaning system, but whether or not it is shared with the adult is unknown. The activation of the child's meaning system will also depend on his/her developmental level. For communication to transpire, i.e., for mutual understanding of the message, there has to be shared meaning. If this is not the case, then the student will not be able to engage appropriately in the discourse. In fact, it is likely the student will not profit from such interaction. The requirement for positive inquiry interaction is that the questions be calibrated in terms of the respondent's status. Here we emphasize the meaning aspects which may not only be directly related to the development level of the student, but also to non-developmental factors such as educational background, knowledge base, language background, etc. The lack of

comprehension then may be due to a number of discrepancies in meaning or interpretation of a message or question. The dictum, define your terms in an argument, although a cliche, has truth because of the potential miscommunication that can occur if the meanings of terms are not shared. For example, consider many abstract nouns such as value, love, morality. Each has multiple meanings.

Meaning refers not only to cognitive aspects of an action or utterance, but also to the speaker's intention, e.g., the speaker can be trying to influence the student subtlely, or motivating him/her, or trying to get the student to become aware of his/her limited knowledge. Many times the question can serve different purposes in the context of the inquiry interaction. Each of these factors can play an important part in influencing the response and hence the inquirer must be alert to all these factors if the process is intended to promote thinking and learning.

In sum, inquiry, and the use of questions, are complex, involving cognitive, social and emotional features. Since the intention of inquiry strategies is to enhance learning of the student, then it behooves the inquiring adult to be sensitized to these issues. As we shall see in our review of the Dillon tapes, many questions were asked by teachers. Did these questioning strategies help the student to increase his/her thinking skills? solve problems?

The conceptual framework describing distancing theory in general, and functions of questions in particular, forms a backdrop against which the practice of questioning can be derived. Three central propositions

undergird our perspective: (1) cognitive growth proceeds through assimilative-accommodative processes activated by discrepancies arising from internal and/or external violation of expectations; (2) by appropriate use of inquiry, distancing strategies can generate discrepancies which can further cognitive growth; and (3) targeting questions for particular cognitive processes can enhance change laterally (i.e., expanding one's skills) and vertically (i.e., contributing to movement from one cognitive stage to another).

This conceptualization, however, can be actualized if and when the inquiry process is skillfully executed. Let us outline some guidelines for "good" inquiry" deriving some of the rules from the above conceptualization.

What does it take for good inquiry and was only evident in the tapes?: A good inquiry teacher should, we believe, follow the following rules:

(1) A question must be asked for a reason, be it for information, diagnosis or to activate thinking.

(2) A question must be the target, i.e., the sequence should have the object or purpose of the question in mind.

(3) The question should be clear and appropriate to the developmental level of the child. This means the vocabulary level and the symbolic structure should contribute to clarity of the message.

(4) The question should be calibrated to a discrepancy--neither too easy nor to hard to get the child to think.

(5) The inquirer should listen to the response, both its manifest and its latent meaning.

(6) The inquirer should make certain he understands the response.

(7) The inquirer should be sure his/her questions move the discussion forward to an objective, but he/she should be aware when he/she has acquired the necessary information, i.e., know when to quit or shift to someone else.

A Teacher Looks at Distancing[2]

The distancing strategies model was employed by one of us (Kelley) as part of his instructional model (Kelley, 1985). The initial task of the teacher is to tune into the student's developmental state, atttitude and relevant experience--a perspective consonant with the distancing model.

There are two basic ways to go about doing this: through the use of inquiry and by observation of students' behaviors in classroom activities. Beginning with an open-ended question or problem to get at the essential nature or concept behind the information or skill which is to be taught is a practical way to get started. For example, suppose one is teaching the numbers 1 to 10 and the skill of measuring to a class of kindergarten children. Measuring is part of an understanding of spatial relationships and that numbers are commonly used to represent quantification of those relationships. Based on these considerations and a sensitivity to the vocabulary and general experience of the group (socio-economic background), a question such as: "What does it mean

when we talk about the size of something?," might be formulated. Now as the teacher listens to answers to this question, he begins to get information from the students to infer their developmental status, experiential background, and attitude about the immediate experience--as exemplified in the following interaction:

Dialogue #1[3]

TEACHER: What does it mean when we talk about the size of something?

KERRI: You learn the size.

GABE: When you buy something you know the size of it.

BUDDY: Some things are big and some things are little.

MELISSA: You're big and we're little.

KEVIN: We're big and you're little (ha-ha).

TIMMY: If you love someone your heart get's bigger.

KEVIN: If something is from the floor to the ceiling then it is a real big building.

GIBBI: Buddy is bigger than Kevin and Pat is bigger than Buddy and you are the biggest.

ANDY: When you eat things you get bigger. If you eat junk food, you get fatter. I'm bigger than my baby brother.

The teacher can continue to call for more answers. As students are responding, the teacher looks carefully for visual signs of engagement from other students, watching facial characteristics carefully, as well

as body language. The teacher must be sensitive to the affective state of the student in order to maximize the learning experience, and become knowledgeable about their feelings through watching and listening for each student's degree of engagement. Each specific behavior must be judged against the backdrop of the student's overall personality. If the student is generally shy but is raising her/his hand in an agitated way, then the discussion hits upon an area of high interest or great security. Then asking an immediate follow-up question about her/his answer might be the course to take.

The answers are restated, followed by the question: "Can size mean anything else?" Now is the time for the teacher to wait. What seems like many minutes may really be only seconds. The children are on the spot. They usually have more to give if given time to think. A few seconds waiting time is possible.

Dialogue #2

TEACHER: Can you tell me the name of one object that is big and one object that is small? (I ask the boy who is moving about.)

JOSEPH: T.V. is big and a tape recorder is small. (He is looking at these two objects in the room.)

MELISSA: I'm big, my cabbage patch is small.

KEVIN: Flag is big, the bell is small.

CHRISTINE: Daddy lions are big and kittens are small.

CURTIS: A dinosaur is big and a pearl is small.

HEIDI: Flower is little, tree is big.

SEAN: Thirty is big, one is small.

BUDDY: School is bigger than a flower.

While the answers to the original open-ended question gives information about individual children's thinking processes, the convergent question above requires answers that also give indications of previous experience, acquired information, and interests. (See Melissa's answer in Dialogue #2.) Listening to these answers provides a time to formulate the specific problem or question which will lead to an activity. But, before detailing the activities which are based upon the information, let us look at the questions asked in terms of "distancing strategies."

QUESTION #1: "What does it mean when we talk about the size of something?"

This was a question which attempted to instigate, activate, and organize the children's thinking. While virtually all the children had come to the class with many experiences in which size was an observable factor, they were asked to recall and integrate experience so as to be able to use representational thought (as opposed to sensori-motor action) to meet the cognitive demand of the question.

This particular question implies a class of events which fall under the abstract label of size, while the form of the question (what does it mean when we talk about) puts the activity of talking about (in this

case, size) into a special class of events which will come to be known as "defining." The use of the word "means" encourages each child to give his or her own interpretation of what the word brings to mind.

QUESTION #2: "Can you name an object that is big and an object that is small?"

This question is asking the children to compare objects and classify them according to size. It also fosters representational competence in that it asks children to not only sort and classify, but do so mentally by using the names (or labels) which objects are given.

Through the asking of two questions, information was collected about individual students as well as the general disposition of the group (20 children). Now transition has been made between the children's answers and the formulation and articulation of an activity which meets the teacher's goals. It may be recalled that the goals were to understand the notion of measurement and also practice the use of the numbers 1 to 10. Melissa's answer about her Cabbage Patch Kid doll was used as the basis for the problem. Dialogue No. 3 describes the discusson with Melissa's answer.

Dialogue #3

TEACHER: Melissa said that she is big and her Cabbage Patch Kid is small. If she is big and her Cabbage Patch Kid is small, then what size is her dad? (wait)

GIBBI: She's bigger than Rachael (the doll's name) and her dad is bigger than her.

TEACHER: You seem to be saying that big is different than bigger and small is different than smaller.

TEACHER: If we talk about sizes being bigger and smaller, we need a way to find out how much smaller or how much bigger. what could we do to find out Melissa's size and her doll Rachael's size?

BUDDY: Measure.

TEACHER: How do you measure?

BUDDY: You can use a stick or something that tells you how big it is.

TIMMY: You can step on something and it tells you how much you weigh.

KEVIN: And the scale has a pole on it that tells you how tall you are.

TEACHER: Yes. Could we use these blocks (pointing to a pile of blocks) to measure Rachael? Let's see. (He lines up blocks next to the doll.) How many blocks long is Rachael? Help me count!

ALL: 1, 2, 3.

TEACHER: Rachael is three blocks long. Let's measure Melissa and see what her block size is. (All help to line up blocks)

TEACHER: Let's count the blocks together.

ALL: 1, 2, 3, 4, 5, 6, 7, 8.

TEACHER: Melissa's size is 8 blocks long. Since her dad isn't here, you can measure me because I think I am the same size as her dad.

Everyone giggles as they line up the blocks next to the teacher. They count.

ALL: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13.

TEACHER: I'm 13 blocks long.

I'll write the size of Rachael (3), Melissa (8), and me (13) on the board. Would you and your partner get some blocks and measure each other to find out your body size? Be sure to remember your size so you can write it down later.

In setting up this activity, the goal was to design it so that the students would have an opportunity to use objects with which they were familiar in a new way (measuring the doll and using blocks to measure). We believe that their own experience, interests, and knowledge, as well as their immediate environment, are good "jumping-off" places for exploration and reflection.

During the activity time, the students interact with their partners. This is a time when they explore and engage in various types of social behavior (cooperating, responding, suggesting, etc.) as well as have the opportunity to put into practice the ideas the students and the teacher discussed. The behavior of the children is observed and help is provided when needed. If there is a problem the teacher tries to relate it to the students' thinking by asking a question. This small group time generally permits opportunities to observe and evaluate students' perceptions and to clarify the teacher's thinking. In cases where student planning is a necessary prerequisite for the activity, the

students have to articulate what it is they would like to do to their partners. Concensus has to be reached and sometimes conflicts can be arbitrated by asking questions, e.g., "Is it fair that you get a turn to try it your way and Tommy doesn't have a chance to try his? Thinking, for young children, is only relevant as it relates to actions. Action influences thinking and thinking in turn influences action. In this activity, children share a common experience upon which they can reflect together. It is important in setting up activities that the students feel a certain level of comfort, interest, and challenge, but not so that a great deal of anxiety is generated.

Before explaining the third and final aspect of the method with distancing, we shall examine the question used in the second or activity section of the lesson.

QUESTION #3: Melissa said that she is big an her cabbage patch is small. If she is big and her Cabbage Patch is small, then what word would you use for the size of her dad?

With this question the teacher attempts to do two things. First, a discrepancy is generated by including a third example which didn't fit into Melissa's comparison of big and small. The students were asked to compare by describing or inferring the size characteristics of three people. By injecting a third example into Melissa's example and asking how it fit in, a problem was created. One solution the students used in similar situations was to reorder and rename the items. They would then

call Melissa medium sized and her dad big. When a fourth item was added to the list, they begin to grope for words and the time is right for introducing the idea of using numbers. However, in the example, Gibbi again reflects her developmental stage by her use of comparative words (bigger than, biggest). It was appropriate to briefly restate the issue and clarify her answer, while keeping in mind that interest might decline if there was too much discussion.

If students are positively engaged in working at a task during activity time, the teacher stays away. If frowns and great anxiety appear, they signal help, but generally the teacher lets exploration, discovery, and invention do their work. If perplexed, a student will usually come to me for help. If the purpose of the visit is to see what the teachers "want," the response can be, "What do you think would be _____?" This usually reaffirms the student's confidence in his/her ability to think and decide. When the purpose is for technical information, it is supplied or the student is encouraged to find an appropriate source. One example of the type of behavior is described below.

EXAMPLE #1

> Christine and Penny are taking a lot of blocks. Christine lays down and Penny starts to place the blocks along the side of her but she doesn't stop there. She continues until she has made a rectangle of blocks around Christine.

The activity behavior of these fours students reflects their thinking and exploration of something new. It would be counter-productive to impose the "right way" on them. During the "reporting" time they will be asked to describe or show what they did so that they can understand their own behavior.

The "reporting time" is when everyone convenes after an activity. The students are asked to reconstruct what happened during the activity time. It is a time for the children to reflect on their own actions. A brief example is described below. The students are asked: "Would you please tell whose body length you measured and report what their block size was."

Some responses were:

KEVIN: "I measured Danny and he was 7 blocks long."

GABE: "Buddy was 8 blocks long."

P.J.: "Bryan was 4 blocks long."

MELISSA: "Clair is 9 blocks long."

The names are written on a large chart and ask each reporter to write the number next to the name. After all the numbers are on the chart the last dialogue for this session begins.

Dialogue #4

TEACHER: Let's take a look at these numbers. Who is the biggest person?

GABE: Chaire. She is 9.

TEACHER: Who is the smallest person?

SEAN: Bryan.

TEACHER: How do you know Bryan is the smallest?

SEAN: Because he is 4 long.

TEACHER: Bryan, would you please stand up. Does Bryan look the smallest?

ALL: No.

TEACHER: Buddy, would you lay down next to Bryan on the floor.

MELISSA: They're the same.

TEACHER: Why is Bryan's size number so much less than Gabe's?

BRYAN: I know why. Because this block (picks up 10-inch block) makes three of those (points to 5-inch block).

TEACHER: How could we find out if that is so?

BRYAN: . . . . . picks up a 5-inch block and puts it on the 10-inch block.

BRYAN: I mean two.

TEACHER: O.K. Did you use the larger blocks to get measured?

BRYAN: Yes.

TEACHER: You were 4 of these blocks long. Let's see what that means in shorter blocks. (Teacher places four long blocks on floor. Bryan helps to put short blocks on top.) Let's all count the blocks.

ALL: 1, 2, 3, 4, 5, 6, 7, 8.

TEACHER: What does this tell us about measuring? (Wait--long silence.)

BRYAN: We should all use the same size blocks.

BUDDY: It isn't fair if some people use long or shorts.

TEACHER: Yes, if we don't know what kind they are using, but if they tell us then we can still understand their size.

The reporting session is valuable because it gives the students information about the thoughts, activities, and knowledge of other students. It gives the teacher more information about students' information, perceptions, and misperceptions. It gives students a chance to practice communication skills. If the student is having trouble describing his/her behavior, more questions are asked which will aid in the description of the activity. Most importantly, it is part of a process which is directed toward students forming generalizations, theories, or new hypotheses.

What has been shown by the above dialogues is how distancing strategies are used in the context of classroom planning and behavior. The examples involved the content area of physical concepts. The strategies may be used in any content area and with any age or experience level. It may be instructive to also point out that it can

be used effectively to teach students about their own cognitive processes. That is, questions which ask a group of students to reflect upon their group (behavioral) process as well as their individual (mental) process. The reflection on group behaviors may begin with questions like, "What did we do first?" After reconstructing the behaviors, a question may be asked which calls for a generalization, conclusion, or prediction. To promote thinking about thinking, there must be important meaningful content to reflect on.

We have tried to provide the basic contextual components of an approach which strives to give students the opportunity to develop their thinking processes while learning the information and skills that are necessary. The distancing model has been a guide in helping to determine what kinds of questions are best suited to promote particular thinking responses.

Kelley, after reviewing the dialogues with the young children, noted that the conversation followed a consistent sequence which he labeled the Learning Cycle. Figure 1 represents the Learning Cycle which involves three identifiable phases: focus, exploration, and restructuring. Movement from one phase to another depended on the distancing strategies he used.

Insert Figure 1 about here

The Learning Cycle depicts the cyclical nature of the inquiry-teacher process as described in this essay. The cycle is

consistent with the distancing model in that it describes a process of interaction that is not only cyclical, but moves steadily to new levels of knowledge and inquiry influenced by the distancing strategies involved.

How and when, and most importantly, why, each of these expressions takes place are directly related to the mental development of each student, as well as the class as a whole. Through the purposeful, sensitive use of appropriate distancing strategies, students appear more self-confident in their ability to deal with life in the school setting.

What we learn from classroom dialogues is that the students learn, not only content, but also how to think reflectively, how to analyze, and how to synthesize the information dealt with. Taba puts the effort in perspective when she writes about inquiry and questioning, to wit "to cultivate the type of mental processes which strengthen the capacity to transfer knowledge to new situations, the creative approaches to problem solving, and the methods of discovery and inventiveness" (Taba, 1962, p. 275). The distancing model described in the foregoing section helps achieve the above objectives.

Analysis of Dillon Tapes

The transcripts we have elected to analyze include a discussion of a history lesson, an English lesson, and a school policy issue. Our analysis will be guided by the Learning Cycle Model which we have discussed previously, as well as the embedded distancing strategies, since it is these strategies which move the student through the cycle.

Analysis of HK

This excerpt opens with two questions where the teacher tries to focus the discussion on Washington as a successful military leader. The questions HK asks appear to be requests for reproducing familiar materials which are low-level distancing strategies. Each question is structured the same. The focus is double-barrelled, leaving the student with the choice to respond to the "success" aspect of the teacher's inquiry or to the issue of tactics. The student responds by describing how the American soldiers fought, focussing on neither the teacher's questions nor offering any new ideas of his/her own. The teacher continues to question, not getting involved in the student's question. HK proceeds to ask another reconstruction memory closed question on a seemingly tangential issue; namely, "What is happening to Washington's army?". There is no ostensive connection between either HK's "initial inquiries and the student's answers. Hence we can conclude that the focus continues to be muddled. A new focus emerges briefly regarding the issue of Washington's army being outmaneuvered and destroyed. HK explores this issue briefly using a Level 2 question,[4] i.e., "What is the difference between being outsmarted or destroyed in a military context?" The teacher does return to the issue of Washingtion's success, apparently in an attempt to review the lesson and obtain closure to move on to some other issue. However, students continued to explore, but the teacher shifted the focus again by pointing out that the student had contradicted himself. A new focus emerges which has to do with the nature of the colonial armies. There is some evidence of

exploration here, but the teacher used closed recall questions with minimal cognitive demands to reconcile differences discussed previously, to present and to discuss alternatives, or to engage in any evaluation. Each of these is a reasonable option to engage the students to think about the assertions they and the teacher have been making about Washington's military prowess. Exploration follows on the topic of the army, and here again most questions were closed, engaging reconstructive memory. In fact, most questions dealing with the Continental Army were closed, and all the student had to do to answer them was to retrieve already acquired knowledge in contrast to the teacher using distancing strategies which would generate discrepancies which in turn would lead to the restructuring of the student's existing schema into new integrated knowledge.

In the course of the exploration phase, HK finally challenged students to transcend their textbook recitations to evaluate the meaning of their comments when he says, "What do you mean by that?" He asks for concrete examples of aid to the armies, but here again the students regurgitate what they already know. In this restricted context, using essentially low-level distancing strategies, the teacher proceeds to the end of the lesson. Not only does he move to the end of the lesson by using low-level strategies, but he also seems to move quickly, giving the students little "wait time".

In sum, HK does use a lot of questions, but they are low-level, giving the students little time to reflect on what is going on, both in the text and in the discussion. There is little evidence of thoughtful,

evaluative questioning. Most of the questions also prevent the students from exploring and hence moving on to restructuring their knowledge of the events under discussion. On the basis of this transcript, we would think this teacher is not very effective in help his students develop analytic skills.

Let us turn now to PK who does move the students along by provocative inquiry strategies.

Analysis of PK

The lesson the students are working on is an analysis of the book "The Three Faces of Eve." Initially, the teacher structures the lesson, focussing on the immediate task for the class by asking, "How are we going to help her deal with the three personalities?" which reflects the theme of the book. The teacher having focussed the discussion, then moves quickly into the exploration phase which moves the discussion step by step to requests for inferences about various options proposed for helping Eve integrate the three personalities or so deal with the problem that she emerges as a whole person. Although the students' responses are short, the teacher persists in asking the students to explain or to justify their particular offerings. In addition, the teacher proceeds to offer counter-examples to any assertions made by the student. For example, in discussion of which personality was more dominant, the students says that Eve Black was more dominant. The teacher challenges the student by asking if Eve Black was not the more extrovert, kind of sleazy? It is concluded that in spite of the extroversion, Eve White the introvert is the more dominant.

Rather than getting involved in disputing the issue further, the teacher focuses the discussion on the basic issue: how to help Eve achieve a single personality. The teacher brings the students back to the exploratory phase by asking them to describe what they might do to solve Eve's problem. Now the students are in the exploration phase, but at a high level; they are involved in anticipation, predicting and using imaginative processes to solve a problem. To accentuate the task before them, the teacher poses conflicts for the students by responding to a student's suggestion, for example, that two of the three personalities should be knocked out, instead of trying to integrate them. The teacher asks what the consequences of such a decision would be. Why not integrate them? Or to the suggestion of integrating the three personalities or even the teacher asking students to justify their point consequences. In effect, the teacher asks the students to justify their points of view. The discussion has now entered a transitional phase moving from exploration to restructuring. What the students are being asked to do is to formulate hypotheses to be used in coming to terms with the problems. The cognitive processes involved in this exploratory phase are anticipation and predicting, each of which narrows the focus leading to a restructuring of their efforts. Now a new set of issues arises involving an analysis of the patient's background. Having restructured the problem, the new hypotheses serve as a new focus and the cycle repeats itself as the students begin to explore ways of examining their hypotheses.

The distancing strategies the teacher used in this excerpt tend to be at Level 3, e.g., seeking causal connections, seeking explanations, and seeking alternative plans to problem resolution. Each of these types of questions enhances the data base for the students, creating movement toward deciding a course of action.

The teacher does integrate the material as they proceed in the discussion, and in this way, brings the students' ideas together. The students, with the teacher's guiding questions, come to develop a point in the discussion the does not accept the final solution but asks if there are any alternatives to the ideas proposed. Although this shifts the focus, the teacher is staying within the parameters of the original problem; namely, coming to understand the dynamics of Eve and offering choices for ultimate solution to the multiple-personality problem.

The teacher moves the discussion along at an active pace, he/she seems to involve many of the students in the discussion. The teacher creates the environment wherein the students are encouraged to focus on issues, explore ideas, and come to restructure their thinking. What seems to contribute to this movement is the level of question asking, which consistently makes strong cognitive demands on the student to generate ideas, either in the form of hypotheses or of explanations.

Comparison of the Academic Excerpts

The contrast between HK and PR is striking. HK asks more low-level questions, which are tangential and not focussed on the specific goal he sets out for himself, while PR moves directly to the goal which is set in the beginning. If one were to draw a tree diagram depicting the

sequence of HK, the picture would reveal a series of branches moving away from a trunk with only slight reference to the trunk. Thus in the elaboration phase of the discussion, the questions move the students away from the central theme rather than toward coming to some understanding of the issue before them; namely, evaluation of Washington as a military leader. The lack of analysis of the issues is particularly evident in this except of HK in contrast to PR.

PR, on the other hand, by relatively direct associative recall questions (Level 1 and Level 2 questions) established a basis from which to move on to higher level questions involving hypotheses generating thinking. In this way the discussion moves forward toward the goals set at the beginning of the lesson. Let us turn now to an analysis of the excerpt of teacher MK.

Analysis of MK

In this excerpt, the class is discussing a school policy on smoking. In contrast to the previous excerpts focussing on a strictly academic subject matter, this one involves policy questions which seem to elicit students' and the teacher's personal experiences and opinions. The teacher structures the situation in terms of students' opinions regarding school policy on smoking. In this episode students and teachers ask questions of the group and they tend to be Level 3 questions, e.g., alternatives to policy restriction on smoking. The content, as well as the focus, seems to foster a general discussion mode emphasizing feelings about the policy. As the session develops and the students proceed to argue the pros and cons of the policy which bans

smoking from school grounds, they do begin to seek a solution. Reasons for the policy are brought up by students and the teacher, with the teacher refocussing the issue to explain why there is a ban on smoking. The students are encouraged by the generally apparent informality to voice their own opinions, offering alternatives such as restricted areas, etc., where smoking can be allowed. These alternatives are not elicited by the teacher, but by the student's own interest in the issue. The teacher in the elaboration brings his/her own experiences as a smoker and the students do the same. This elaboration is not directly aimed at coming up with suggestions for formulating policy, but rather, it seems to be a sharing of feelings with no clear-cut goal other than to ventilate. The discussion also involves suggestions for disciplining students who violate the policy. The students come up with their own solution that smoking is a personal responsibility, but there is no consensus decision regarding the issues before the group. A new focus, or at least a new aspect, of the general problem arises when the teacher asks, "What is the Christian response to smoking?" He poses this as a hypothetical situation. He asks open-ended questions to get students to elaborate on their attitudes and experiences. There is no restructuring.

What does this excerpt teach us? This is a lively discussion with minimal teacher leadership. The teacher is more like a participant in the discussion, sharing his own experiences on the same level as the students. The movement was consistent in the overall direction, and in

a sense the students, with their own open-ended questions, moved the discussion forward.

Reflections on Excerpts

These three excerpts demonstrate variation among the teachers' individual styles of conducting a lesson. The differences were not only a function of teacher preferences and perhaps skills (note comparison between HK and PR), but a function of the subject matter under discussion. In the MK situation, on the other hand, the teacher did not serve as the expert or as the judge of the appropriateness of the students' comments. He was more like a referee.

What we believe is the contribution of our analysis of these tapes is the analytic approach we have taken. Using the Learning Cycle as the overarching framework defines the structure within which the distancing strategies is embedded. They are the teacher's behaviors that propel the child from one phase of the cycle to another.

Our approach allows for a method by which to compare classroom teachers' interactions with their students because the categories are observable and inherent in classroom discussions. It seems to us that when a discussion moves along, the phases described in the Learning Cycle happen in the natural course of events. We are articulating the cycle to provide teachers with system by which to analyze the flow of the discussion.

Coding systems are already available for the distancing strategies. These systems have been used successfully by teachers and researchers.

The Learning Cycle concept provides an overarching approach that describes the teaching context, whereas the distancing strategies are the teacher behaviors which provide the movement both in direction and in the pace of the discussion.

Summary and Conclusions

Two major issues form the underpinnings of this essay: first, the psychological significance of the inquiry process, particularly in the sense of questioning; the second has to do with the development of a conceptual framework to study the questioning approach.

In the discussion we have presented a theory describing the questioning approach, which we have referred to as distancing. However, we discovered that the questions used seem to alter the context in which the questions were asked. Kelley came up with the Learning Cycle concept, because as a classroom teacher, the cycle was evident in the movement in the class.

The Learning Cycle incorporates the distancing stragegies. This is a total system since the Learning Cycle and the distancing strategies are inextricably linked. To be sure, the distancing stragegy level can vary. The teacher decides what type of strategy to use. Some strategies will facilitate the discussion and move it from one phase to another, while other strategies preclude movment (note the strategies used by HK). The important point here is that it is the type of distancing strategy the teacher uses that is a key determinant of the direction of the discussion, and hence, of the Learning Cycle.

We believe the Learning Cycle-Distancing Strategy Model is valuable as a conceptual tool, and also as a practical analytic method to describe what goes on in a classroom. Conceptually, the Learning Cycle provides a developmental context in which cognitive movement occurs. It specifies the dynamics of change within that particular context. However, it also can reveal that no movement is occurring, and since movement implies learning, it becomes patently clear that the students are not assimilating nor accommodating to the new knowledge. The reason for this lack of movement can be determined by examining the distancing strategies the teacher uses. The Learning Cycle describes the movement phases and their distancing strategies inform us of the rational of the movement. By demonstrating the system for young children and high school students, we have demonstrated that the system is applicable to a wide spectrum of classrooms. It seems to us that the cyclical movement in classroom discussions, while generally observable, has yet to be evaluated in terms of the long-term effects on the children's learning and retention of material. Just what is learned and how well the experience provides the children with both a substantive knowledge as well as skills in problem solving competence remains to be seen. On the basis of informal classroom observations, and on the basis of the analysis of the Dillon tapes, we feel optimistic that the system we propose can serve the two purposes, described in this paper: a basis for conceptual analysis of classroom interaction and a heuristic one, a way of analyzing classroom interaction.

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Footnotes

[1]Portions of this paper are taken from Sigel and Cocking, 1979. Part of the research reported in this paper was supported by the National Institute of Child Health and Human Development Grant No. R01-HD10686 to Educational Testing Service, National Institute of Mental Health Grant No. R01-MH32301 to Educational Testing Service, and Bureau of Education of the Handicapped Grant No. G007902000 to Educational Testing Service.

[2]These dialogues were recorded by Todd Kelley from his class of young students (ages 5-8) working on these problems. Kelley is the teacher.

[3]This and subsequent dialogues are verbatim statements of the children taken from audiotapes in the classroom. The tapes were edited previously.

[4]See Table 1 for the levels of Distancing Strategies.

Table 1

Distancing Strategies[a]

To observe[b]	Asking the child to examine to observe, e.g., "Look at what I am doing."
To label	Naming a singular object or event, e.g., naming a place, person, alternate. No elaboration. "What color is the block?" "Where is Joel?"
To describe	Providing elaborated information of a single instance. Descriptions are static; provide no dynamic relationships among elements, no use and functional characteristics. "What did the car look like?"
To sequence	Temporal ordering of events, as in a story or carrying out a task. Steps articulated; last, next, afterwards, start, begin are possible key words. "First we will look at the pictures, then we will make up a story." Teacher telling, "Your turn is after Paul's." "Are you next?" (sometimes confused with structuring, as in "Paul, it's your turn.")
To reproduce	Restructuing previous experiences, dynamic interaction of events, interdependence, functional. "How do you do that?"
To compare	Noting (describing or inferring) characteristics or properties.
(a) Describe similarities	Noting ostensive common characteristics (perceptual analysis) "Are those the same?"
(b) Describe differences	Noting ostensive differences among instances (perceptual analysis). "In what way are the truck and airplane different?"
(c) Infer similarities	Noting nonobservational commonalities (conceptual).

(Table continues)

Table 1 (continued)

(d) Infer differences	Noting nonobservable differences (conceptual).
To propose alternatives	Offering different options, different ways of performing a task.
To combine	
(a) Symmetrical classifying	Recognizing the commonalities of a class of equivalent instances. "Why did you put those two together?"
(b) Asymmetrical classifying	Organizing instances in some sequential ordering--seeing the relationship as a continuum, seriation of any kind, comparative, where each instance is related to the previous one and the subsequent one, relative (big to small, more or less).
(1) Enumerating	Seriation: enumerating of number of things unalike; ordinal counting (1, 2, 3, 4, 5). "Count how many there are." "Is this tree bigger than that one?"
(c) Synthesizing	Reconstructing components into a unified whole; explicit pulling together; creating new form, sum of a number of discrete things.

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[a]This is not an exhaustive list of strategies.

[b]Each strategy is a "demand" for the child to engage in particular operations which are inherent in the structure of the statement. The "demand" quality is implicit in the strategy. The form of the strategy may vary (see Table 2). The singular examples listed here are illustrative and not to be construed as exhaustive.

Table 2

Structural Characteristics of Distancing Behaviors

		Interrogatory				
Statement	Type	Declarative	Direct	Indirect	Intonation	Imperative
Closed	convergent	The boy is upset because his dog ran away.	How did the boy feel when his dog ran away?	I wonder if the boy was sad when the dog ran away.	The dog ran away. The boy was sad.[a]	Tell me why the dog ran away.
Open	divergent	There are other ways the boy could feel when his dog ran away.	What can you tell me about the boy and his dog?	The dog ran away. I wonder how the boy feels.	The dog ran away and you said he is sad about it; he might have some other feelings.[a]	Tell me about the boy and dog.[b]

[a]The interrogatory is reflected in the intonation.

[b]The difference between declaratives and imperatives is intonation as well as syntactic structure.

Figure Caption

Figure 1. The Learning Cycle.

new problem situation question
new awareness knowledge + skills
focus
discrepancy
reflection on action
concept invention theory building discrepancy resolution
restructure
experience with objects, ideas, + events
development and refinement of skill and knowledge
exploration
engagement
special problem situation open question
focus
prior knowledge experience + feelings

Figure 1